

**REMARKS**

Claims 26-32, 71 and 77 remain pending. Please reconsider the above-referenced application in light of the following remarks.

At the outset, Applicant respectfully submits that claim 72 is not pending. Claim 72 was previously canceled in the amendment dated September 30, 2004. Consequently, no response is needed to the Office Action's anticipation rejection of this claim.

Applicant also respectfully submits that claim 77 is in immediate condition for allowance. Claims 26-30, 32, and 71 stand rejected under 35 U.S.C. § 102(b) and claim 31 stands rejected under 35 U.S.C. § 103(a). Claim 77 was not rejected over the prior art of record. In light of these facts, claim 77 is in condition for allowance.

Claims 26-30, 32, and 71 stand rejected under 35 U.S.C. § 102(b) as being anticipated by EP 0553961 A2 ("Hamrah"). The rejection is respectfully traversed.

At the outset, Applicant respectfully submits that claim 26 does *not* recite "a composition *comprising*: a flowing plasma etchant mixture *consisting essentially of* at least one fluorocarbon and ammonia," as the Office Action asserts (pg. 3) (emphasis added). Claim 26, in contrast, recites a composition *consisting of* "a flowing plasma etchant mixture *consisting of* at least one fluorocarbon and ammonia, said at least one fluorocarbon and ammonia form a reactive mixture." (emphasis added).

Similarly, Applicant respectfully submits that claim 71 does *not* recite "a composition consisting of: a *flowing* plasma etchant mixture consisting of CF<sub>4</sub>, at least one other fluorocarbon, and NH<sub>3</sub>," as the Office Action asserts (pg. 4) (emphasis added). Claim 71, in contrast, recites a "*a plasma etchant mixture* consisting of CF<sub>4</sub>, at least one other fluorocarbon, and NH<sub>3</sub>." (emphasis added).

Moreover, Applicant's claimed composition *consists of* only at least one fluorocarbon and ammonia, as recited in claim 1, or only CF<sub>4</sub>, at least one other fluorocarbon, and NH<sub>3</sub>, as recited in claim 71. Hamrah's etchant composition *includes* Ar.

This fact is underscored by the Office Action's acknowledgement that Hamrah discloses "an oxide etch chemistry that *includes* CHF<sub>3</sub>, Ar, and CF<sub>4</sub>." (pg. 3). Although Hamrah may disclose the use of NH<sub>3</sub> *with* CHF<sub>3</sub>, Ar, and CF<sub>4</sub>, Hamrah's etchant composition does *not* consist of at least one fluorocarbon and ammonia. Consequently, Hamrah fails to anticipate the present invention since Hamrah's etchant mixture *includes* Ar gas.

Applicant's claimed plasma etchant mixture prevents the formation of an etch stop when etching an insulative layer (Applicant's specification, pg. 4, ll. 9-10). In addition, the claimed plasma etchant mixture prevents the erosion of sidewall spacers which could materially detract from the performance of a conductive plug and gate stack (Applicant's specification, pg. 12, ll. 10-12). Hamrah's etchant composition, in contrast, merely "increases the oxide etch rate to greater than 5000 Å/min." (1st page, ¶ 57). Hamrah's etchant composition is *not* directed to preventing the formation of an etch stop while etching an insulative layer or preventing the erosion of sidewall spacers.

As such, Hamrah fails to teach a composition *consisting of* "a flowing plasma etchant mixture *consisting of* at least one fluorocarbon and ammonia, said at least one fluorocarbon and ammonia form a reactive mixture," as recited in claim 26 (emphasis added), or a composition *consisting of* "a plasma etchant mixture *consisting of* CF<sub>4</sub>, at least one other fluorocarbon, and NH<sub>3</sub>, wherein said CF<sub>4</sub>, at least one other fluorocarbon, and NH<sub>3</sub> form a reactive mixture," as recited in claim 71 (emphasis added).

Claims 27-30 and 32 depend from claim 26 and should be similarly allowable along with claim 26 for at least the reasons provided above, and on their own merits.

Claim 31 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamrah and further in view of U.S. Patent No. 6,015,760 ("Becker"). The rejection is respectfully traversed.

Claim 31 depends from claim 26 and should be similarly allowable along with claim 26 for at least the reasons provided above, and on its own merits. Specifically, Hamrah does *not* disclose or suggest a composition *consisting of* "a flowing plasma etchant mixture *consisting of* at least one fluorocarbon and ammonia, said at least one fluorocarbon and ammonia form a reactive mixture," as recited in claim 26 (emphasis added).

Hamrah discloses "an oxide etch chemistry that *includes* CHF<sub>3</sub>, Ar, and CF<sub>4</sub>," as further acknowledged by the Office Action (pg. 3) (emphasis added). Consequently, Hamrah fails to teach or suggest Applicant's claimed plasma etchant composition since Hamrah's etchant mixture *includes* Ar gas. The Office Action relies upon Becker for disclosing a chemical etchant system that comprises CF<sub>4</sub>, CHF<sub>3</sub> and CH<sub>2</sub>F<sub>2</sub>, and adds nothing to rectify the deficiencies associated with Hamrah.

Moreover, Applicant respectfully submits that even in combination, Hamrah and Becker would merely disclose an etchant composition consisting of CF<sub>4</sub>, CHF<sub>3</sub>, CH<sub>2</sub>F<sub>2</sub>, NH<sub>3</sub>, and Ar. The cited references still would not disclose or suggest a composition *consisting of* "a flowing plasma etchant mixture *consisting of* at least one fluorocarbon and ammonia," as recited in claim 26 (emphasis added). The Ar gas would still be present in the etchant mixture if Hamrah and Becker were combined.

Further, there is no motivation to combine the references. Becker discloses using  $\text{CH}_2\text{F}_2$  as an additive material. The additive material is *required* because " $\text{CH}_2\text{F}_2$  is added to offset the disassociation properties of nitride as compared to oxide." (Col. 2, lines 24-25). In other words, Becker's etchant composition *relies* on the presence of a silicon nitride layer, i.e., an etch-stop layer. (Col. 6, lines 16-20). There is no silicon nitride layer in Hamrah.

Accordingly, one skilled in the art would not look to Becker for the disclosure of an additive material such as  $\text{CH}_2\text{F}_2$  since there is no silicon nitride layer present in Hamrah's structure. For at least these reasons, claim 31 should be allowable over Hamrah and Becker.

Applicant also submits that claim 77 is not disclosed or suggested by the prior art of record for similar reasons provided above. In particular, the prior art of record does not teach or suggest "a composition *consisting of*: a gaseous etchant mixture *consisting of at least one fluorocarbon and ammonia*, wherein said at least one fluorocarbon and ammonia form a reactive mixture," as recited in claim 77 (emphasis added). As indicated above, Hamrah's etchant mixture would still *include* Ar gas.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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